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10/541,611	07/07/2005	Satoshi Yamanaka	0925-0220PUS1	8340
225/2	7590	09/02/2008	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH			ZHU, RICHARD Z	
PO BOX 747			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No. 10/541,611	Applicant(s) YAMANAKA ET AL.
	Examiner RICHARD Z. ZHU	Art Unit 2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on _____.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-7 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 1-7 is/are rejected.
 7) Claim(s) ____ is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 20 April 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date 07/07/2005 and 05/07/2007.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application
 6) Other: _____

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on application JP 2003-347944 filed in Japanese Patent Office on 10/07/2003. Certified copy of said Japanese Application had been received.
2. Acknowledgment is made of applicant's claim for domestic priority based on PCT/JP04/09179 filed on 06/30/2004.
3. Amendment to the specification filed on 07/07/2005 has been entered and made of record.

Drawing Objections - 37 CFR 1.83

4. Corrected drawing filed on 04/20/2006 is objected to by the examiner. According to Rule 1.84(p), Reference characters (numerals are preferred), sheet numbers, and view numbers must be plain and legible, and must not be used in association with brackets or inverted commas, or enclosed within outlines, e.g., encircled. Fig 19 and Fig 21 of the current drawing contain strike-throughs in what appears to be instructions for replace the original "19" with "21" and the original "21" with "19".

Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in — (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 3-4, and 6 are rejected under 35 USC 102(e) as being anticipated by *Zhang et al (US 7136541 B2)* and alternatively under 35 USC 102(a) by *Zhang et al. (US 2004/0076343 A1)*. Referring to *Zhang et al (US 7136541 B2)* for disclosure unless recommended otherwise.

Regarding the circuits of Claim 1 and therefore method of Claim 4, Zhang discloses a pixel interpolation circuit for generating interpolation pixel data which interpolates an input image based on pixel data composing the input image, the pixel interpolation circuit (Col 7, Rows 1-25, the interpolation method can be implemented as software executing on an image processing device as well as with hardware or combination thereof) comprising:

a plurality of interpolation circuits each calculating interpolation candidate data of a interpolation pixel (**Col 5, Rows 50-60, unknown or missing pixel “x”**) and test interpolation data (**Figs 1-2 and see Col 5, Row 50 – Col 6, Row 10, a, b, c, d, e, and f are actual pixels whereas s, t, u, v are test pixels generated from the actual pixels**) of a plurality of pixels neighboring the interpolation pixel (**Figs 2-4 and see Col 5, Row 18 – Col 6, Row 44**), using different interpolation methods (**Fig 2 and see Col 5, Rows 18 – 32 and Col 6, Rows 18-32, at least the interpolation methods of leftward-up comprising a-f and s-v, vertical-up consisting b-c and rightward-up t-u and c-d**);

a determining circuit for selecting one of the interpolation circuits based on a difference between the test interpolation data and actual pixel data (**Col 5, Rows 18 – 32, Col 6, Rows 18-32, and Rows 57-63, determining the value for x on the basis of a difference between actual pixels and test pixels by, for example, comparing the absolute value of differences of test pixels s-v with that of actual pixels b-e**); and

an output circuit for outputting the interpolation candidate data calculated by the selected interpolation circuit as the interpolation pixel data (**Col 6, Rows 10-18, determining the method that generates the “least harmful” result**).

Regarding the circuits of Claim 3 and therefore method of Claim 6, Zhang discloses wherein the determining circuit calculates binarized or ternarized values of the difference between the test interpolation data and the actual pixel data (Col 5, Rows 18 – 32 and Col 6, Rows 18-32, 1. a-f vs. s-v, 2. a-f vs. b-e, 3. a-f vs. c-d**).**

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2, 5, and 7 are rejected under 35 USC 103(a) as being unpatentable over *Zhang et al (US 7136541 B2)* or alternatively by *Zhang et al. (US 2004/0076343 A1)*, in view of *Utagawa (US 6563538 B1)*. Referring to *Zhang et al (US 7136541 B2)* for disclosure unless recommended otherwise.

Regarding the circuits of Claim 2 and therefore method of Claim 5, Zhang discloses wherein the determining circuit calculates a evaluation data for each of the interpolation circuits and selects one of the interpolation circuits based on the evaluation data (Col 5, Rows 18-32 and Col 6, Rows 18-32, evaluating if the conditions for methods $(a+f)/2$, $(s+v)/2$, $(t+u)/2$, $(c+d)/2$, or $(b+e)/2$ holds. If the condition for any one of the methods holds, said method is selected).

Zhang does not teach calculates a evaluation data for each of the interpolation circuits, by summing up the absolute values of the difference between the test interpolation data and the actual pixel data.

Utagawa discloses a circuit for interpolating a pixel value for an unknown coordinate on the basis of a plurality of neighboring pixels (Fig 2, Signal Processor 46 and see Fig 5 and Col 7, Row 45 – Col 8, Row 40) by employing one method of interpolation out of a

plurality of interpolation methods (**Col 7, Row 60 – Col 8, Row 20, at least the method of up, down, left, and right**) wherein the determining circuit calculates a evaluation data for each of the interpolation circuits, by summing up the absolute values of the difference between actual neighboring pixel data (**Col 7, Row 60 – Col 8, Row 20**), and selects one of the interpolation circuits based on the evaluation data (**Col 8, Rows 30-34**).

Zhang suggested that one of ordinary skill in the art would appreciate the teachings therein and that it fully encompasses other embodiments. As such, by disclose generating test pixels s, t, u, and v from actual pixels a, b, c, d, e and f so as to generate a full neighborhood pixel group similar to that of Fig 5 of *Utagawa*, it would've been obvious to one of ordinary skill in the art to modify the method of *Zhang* with that of *Utagawa* so that evaluation data are generated by summing up the absolute values of the difference between test pixel data and actual pixel data (that is, $G(k, p-1-n)$, $G(k, p+1-n)$, $G(k-1, p-n)$, and $G(k+1, p-n)$ would correspond to s, t, u, v) whereas the motivation would've been to accurately obtains the interpolation amount of the empty grid points (*Utagawa*, Col 3, Rows 15-20).

Regarding Claim 7, *Utagawa* discloses an image scanner comprising a pixel interpolation circuit (Fig 2 and see **Col 5, Rows 32-40**).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 5859712 A, US 5917963 A, US 5953465 A, US 6091862 A, US 6570616 B1, US 6704463 B1, US 6714242 B1, and US 7245326 B2 discloses apparatus and/or method for accurately interpolating pixel value for a coordinate point of "lost pixel" by evaluating neighboring pixels employing a plurality of methods and determines the optimal method which arrive at the least error.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Richard Z. Zhu whose telephone number is 571-270-1587 or examiner's supervisor King Y. Poon whose telephone number is 571-272-7440. Examiner Richard Zhu can normally be reached on Monday through Thursday, 7:30 - 4:00.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RZ²
06/25/2008

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